


Math 204 First midterm examination Summer time ▲ 1439-1438 Time: 90 minute	Department mathematics College of Science	 جامعة الملك سعود King Saud University
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Solve the following questions

Q1: Find the solution of the differential equation [5]

$$\left(3x^2 \tan(y)+1\right)dx + \left(x^3 \sec^2(y)-1\right)dy = 0$$

Q2: Determine the region in the xy - plane for which the following equation

$$\left(x^2 - 81\right) \frac{dy}{dx} = e^x \ln(y-1)$$
 [5]

would have a unique solution through the point $(0,3)$.

Q3: Find the general solution of the differential equation [5]

$$(x+1) \frac{dy}{dx} + (x+2)y = 2xe^{-x}$$

Q4: Solve the initial value problem [5]

$$ye^{-2x} + y^3 - e^{-2x} \frac{dy}{dx} = 0$$

$$y(0) = -1$$

Q5: Find the orthogonal trajectories of the family curves [5]

$$y = cx^n \text{ For } n \neq 0$$